USER MANUAL

CTEK BATTERY CHARGER ***LITHIUM US***
5 YEAR WARRANTY

FOR ALL 12V TYPES OF $LiFePO_4$ BATTERIES ***FULLY AUTOMATIC***

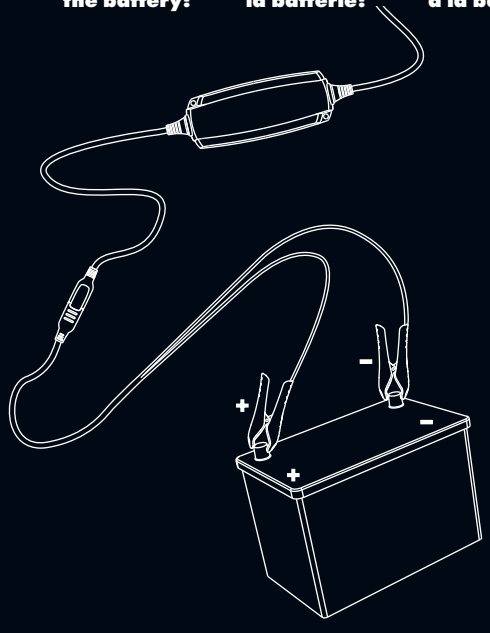
12V
4.3A

CTEK®

1. Connect the charger to the battery!

1. Brancher le chargeur à la batterie!

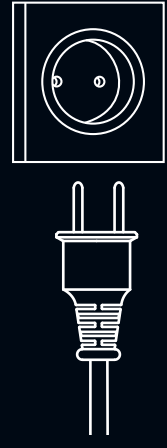
1. Conecte el cargador a la batería!



2. Connect the charger to the wall socket!

2. Brancher le chargeur à la prise murale!

2. Enchufe el cargador en el tomacorriente de pared!

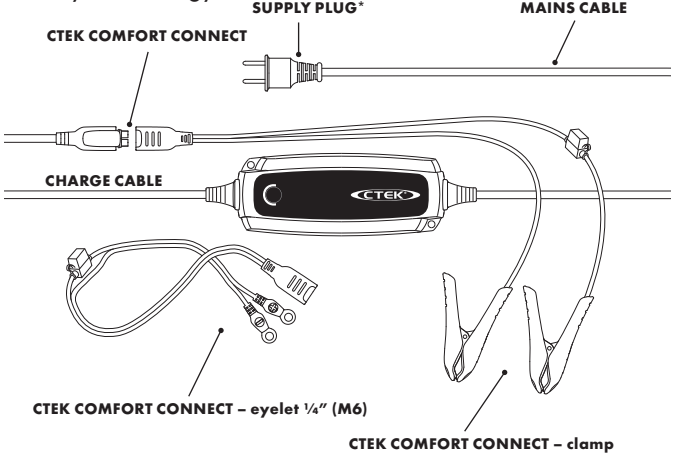


CTEK POWER INC
2374 EDISON BLVD. TWINSBURG, OH 44087-2376 US

MANUAL

CONGRATULATIONS

To the purchase of your new professional switch mode battery charger. This charger is included in a series of professional chargers from CTEK SWEDEN AB and represents the latest technology in battery charging. The LITHIUM US charger model is designed for Lithium-ion batteries using $LiFePO_4$ technology only. Please check with the battery manufacturer for details. Do not use the LITHIUM US charger for any other battery technology.



*Supply plugs may differ to suit your wall socket.

IMPORTANT SAFETY INSTRUCTIONS

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemical known to the state of California to cause cancer or reproductive toxicity.

1. SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions for battery charger model LITHIUM US.
2. Do not expose charger to rain or snow.
3. Use of an attachment not recommended or sold by CTEK may result in a risk of fire, electric shock or injury to persons.
4. To reduce risk of damage to electric plug and cord, pull by the plug rather than cord when disconnecting charger.
5. An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure that: a) Pins on plug of extension cord are the same number, size and shape as those of plug on charger; b) Extension cord is properly wired and in good electrical condition; and c) Wire size is large

enough for AC ampere rating of charger as specified in "RECOMMENDED MINIMUM AWG SIZE FOR AC EXTENSION CORDS".

6. Do not operate charger with damaged cord or plug – return the charger to the retailer.
7. Do not operate charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to the retailer.
8. Do not disassemble charger; take it to the retailer when service or repair is required. Incorrect reassembly may result in a risk of electrical shock or fire.
9. To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning.
10. follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and on engine.

11. PERSONAL PRECAUTIONS

a) Consider having someone close enough by to come to your aid when you work near a lithium-Ion battery.
b) NEVER smoke or allow a spark or flame in vicinity of battery or engine.
c) Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
d) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with Lithium-Ion battery. A Lithium-Ion battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
e) Use charger for charging a $LiFePO_4$ battery only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
f) Never charge a battery with temperature below 32°F if not specified by the battery manufacturer.

12. PREPARING TO CHARGE

a) If necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
b) Study all battery manufacturer's specific precautions while charging and recommended rates of charge.
c) Determine voltage of battery by referring to car owner's manual and make sure it matches output rating of battery charger.

13. CHARGER LOCATION

a) Locate charger as far away from battery as DC cables permit.
b) Never place charger directly above battery being charged.
c) Do not set a battery on top of charger.

14. DC CONNECTION PRECAUTIONS

a) Connect and disconnect DC output clips only after setting any charger switches to "off" position and removing AC cord from electric outlet. Never allow clips to touch each other.
b) Attach clips to battery and chassis as indicated in 15(e), 15(f), 16(b) through 16(d).

15. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. TO REDUCE RISK OF A SPARK NEAR BATTERY:

a) Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
b) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
c) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
d) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to the chassis (as in most vehicles) see (e). If positive post is grounded to the chassis, see (f).
e) For Negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
f) For Positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, –) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
g) When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
h) See operating instructions for length of charge information.

16. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. TO REDUCE RISK OF A SPARK NEAR BATTERY:

a) Check polarity of battery terminals. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
b) Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
c) Position yourself and free end of cable as far away from battery as possible – then connect NEGATIVE (BLACK) charger clip to NEGATIVE (NEG, N, -) post of battery.
d) Do not face battery when making the final connection.
e) When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
f) A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

IMPORTANT SAFETY INFORMATION!

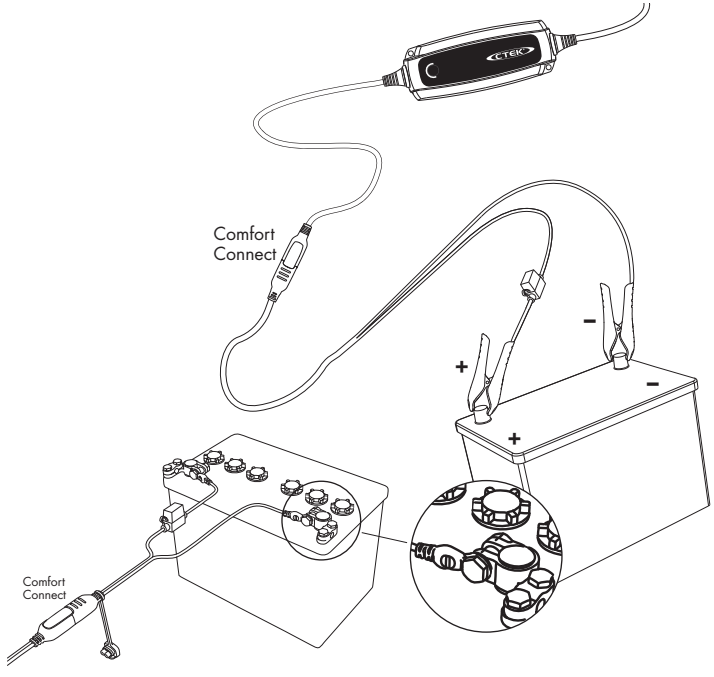
- Charge no other batteries than specified in TECHNICAL INFORMATION.
- Check the charger cables prior to use. Ensure that no cracks have occurred in the cables or in the bend protection. A charger with damaged cables must be returned to the retailer.
- Ensure that the cabling does not jam or comes into contact with hot surfaces or sharp edges.
- Never charge a damaged battery.
- Never place the charger on top of the battery when charging.
- Avoid covering the charger.
- All batteries fail sooner or later. A battery that fails during charging is normally taken care of by the chargers advanced control, but some rare errors in the battery could still exist. Don't leave any battery during charging unattended for a longer period of time.
- If power consumers like fitted alarms and navigation computers are connected to the battery, the charging process takes longer and may drain the battery.

- Always check that the charger has switched to STEP 7 before leaving the charger unattended and connected for long periods. If the charger has not switched to STEP 7 within 24 hours, this is an indication of an error. Disconnect the charger.
- This appliance is not designed for use by young children or people who cannot read or understand the manual unless they are under the supervision of a responsible person to ensure that they can use the battery charger safely. Store and use the battery charger out of the reach of children, and ensure that children cannot play with the charger.
- Connection to the mains supply must be in accordance with the national regulations for electrical installations.
- Do not extend the charge cable.

RECOMMENDED MINIMUM AWG SIZE FOR AC EXTENSION CORDS

LENGTH OF CORD FEET (M)	AWG SIZE OF CORD
25 (7.6)	18
50 (15.2)	18
100 (30.5)	18
150 (45.6)	16

CONNECT AND DISCONNECT THE CHARGER TO A BATTERY



ERROR LAMP

If the error lamp is lit, check the following:

1. **Is the chargers positive lead connected to the battery's positive pole?**
2. **Is the charger connected to a 12V $LiFePO_4$ battery?**
3. **Has charging been interrupted in STEP 1 or 4?**
   Restart the charger by pressing the RESET-button. If charging is still being interrupted, the battery...
   STEP 1: ...can not accept charge.
   ...may be too large for the charger to wake up. Press RESET-button up to 5 times.
   ...a paralell load may be connected to the battery. Disconnect the battery and try again.
   STEP 4: ...can not keep charge and may need to be replaced.

POWER LAMP

If the power lamp is lit with a:

1. **STEADY LIGHT**
   The mains cable is connected to the wall socket.
2. **FLASHING LIGHT:**
   The charger has entered the energy save mode. This happens if the charger isn´t connected to the battery within 2 minutes or the battery on board UVP (under voltage protection) is activated.

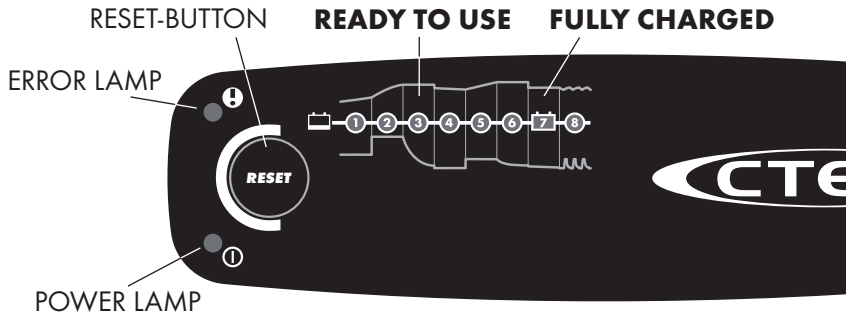
READY TO USE

The table shows the estimated time for an empty battery to reach 90% state of charge (SOC).
Please note that charging times are longer in low ambient temperatures.

BATTERY SIZE (AH)	TIME TO 90% CHARGED
8Ah	2h
20Ah	5h
60Ah	15h

OPERATING INSTRUCTIONS

1. Connect the charger to the battery.
2. Connect the charger to the wall socket. The power lamp will indicate that the mains cable is connected to the wall socket. The error lamp will indicate if the battery clamps are incorrectly connected. The reverse polarity protection will ensure that the battery or charger will not be damaged.
3. Follow the 8-step display through the charging process.
   The battery is ready to start the engine when STEP 3 is lit.
   The battery is fully charged when STEP 7 is lit.
4. Stop charging at any time by disconnecting the mains cable from the wall socket.

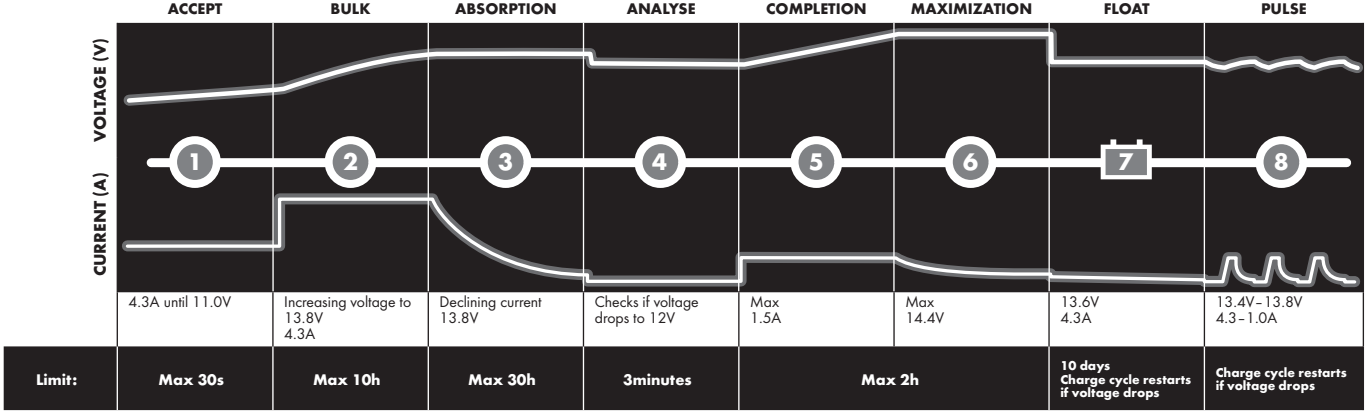


BATTERIES WITH "UNDER VOLTAGE PROTECTION"

Some Lithium-ion batteries have an on-board UVP (under voltage protection) that disconnects the battery to avoid it becoming too deeply discharged. This prohibits the CTEK charger from detecting that there's a battery connected. To bypass this, the battery charger needs to open the UVP.

By pressing the RESET-button for **10 seconds**, the charger opens the UVP. During this process, the charging STEP 7 is lit. Once the UVP has been opened and the battery is ready to be charged, the charger automatically starts the charging cycle.

CHARGING PROGRAM



	ACCEPT	BULK	ABSORPTION	ANALYSE	COMPLETION	MAXIMIZATION	FLOAT	PULSE
	4.3A until 11.0V	Increasing voltage to 13.8V 4.3A	Declining current 13.8V	Checks if voltage drops to 12V	Max 1.5A	Max 14.4V	13.6V 4.3A	13.4V–13.8V 4.3–1.0A
Limit:	**Max 30s**	**Max 10h**	**Max 30h**	**3minutes**	**Max 2h**		**10 days Charge cycle restarts if voltage drops**	**Charge cycle restarts if voltage drops**

STEP 1 ACCEPT
Tests if the battery can accept charge. This step prevents that charging proceeds with a defect battery.

STEP 2 BULK
Charging with maximum current until approximately 90% battery capacity.

STEP 3 ABSORPTION
Charging with declining current to maximize up to 95% battery capacity.

STEP 4 ANALYSE
Tests if the battery can hold charge. Batteries that can not hold charge may need to be replaced.

STEP 5 COMPLETION
Final charge with reduced current.

STEP 6 MAXIMIZATION
Final charge with maximum voltage up to 100% battery capacity.

STEP 7 FLOAT
Maintaining the battery voltage at maximum level by providing a constant voltage charge.

STEP 8 PULSE
Maintaining the battery at 95–100% capacity. The charger monitors the battery voltage and gives a pulse when necessary to keep the battery fully charged.

TECHNICAL SPECIFICATIONS

Model number	1082
Rated Voltage AC	110–120VAC, 50–60Hz
Charging voltage	14.4V
Min battery voltage	2.0V
Charging current	4.3A
Current, mains	1.1A rms (at full charging current)
Back current drain*	<1Ah/month
Ripple**	<4% of rated current
Ambient temperature***	-4°F to +122°F (-20°C to +50°C), output power is reduced automatically at high temperatures
Charger type	Eight step, fully automatic charging cycle
Battery types	12V $LiFePO_4$ batteries
Battery capacity	5–60Ah, up to 120Ah for maintenance
Dimensions	6½ x 2½ x 1½ inches (L x W x H)
Weight	1.4 lbs

*) Back current drain is the current that drains the battery if the charger is not connected to the mains. CTEK chargers have a very low back current.
**) The quality of the charging voltage and charging current is very important. A high current ripple heats up the battery which has an aging effect on the positive electrode. High voltage ripple could harm other equipment that is connected to the battery. CTEK battery chargers produce very clean voltage and current with low ripple.
***) The battery charger is designed to operate from -20°C to +50°C. However battery manufacturers may recommend other temperature ranges for charging their batteries. Please check battery specifications.

CTEK PRODUCTS ARE PROTECTED BY

2012-05-30

PATENTS	DESIGNS	TRADE MARKS
EP10156636.2 pending	RCD 509617	TMA 669987
US12/780968 pending	US D575225	CTM 844303
EP1618643	US D580853	CTM 372715
US7541778	US D581356	CTM 3151800
EP1744432	US D571179	TMA 823341
EP1483817 pending	RCD 321216	CTM 1025831
SE524203	RCD 000911839	CTM 405811
US7005832B2	RCD 081418	CTM 830545751 pending
EP1716626 pending	RCD 001119911-0001	CTM 1935061 pending
SE526631	RCD 001119911-0002	V28573IP00
US7638974B2	RCD 081244	CTM 2010004118 pending
EP09180286.8 pending	RCD 321198	CTM 4-2010-500516
US12/646405 pending	RCD 321197	CTM 410713
EP1483818	ZL 200830120184.0	CTM 2010/05152 pending
SE1483818	ZL 200830120183.6	CTM1042686
US7629774B2	RCD 001505138-0001	CTM 766840 pending
EP09170640.8 pending	RCD 000835541-0001	
US12/564360 pending	RCD 000835541-0002	
SE528232	D596126	
SE525604	D596125	
	RCD 001705138-0001	
	US D29/378528 pending	
	ZL 201030618223.7	
	US RE42303	
	US RE42230	